

Remarks

Applicant respectfully requests the Examiner to reconsider the present application in view of the foregoing amendments to the claims and the following remarks.

The Office Action is non-final. Claims 1, 3-5, 7 and 9-10 are currently pending in the present application. Claims 2, 6 and 8 have been cancelled. Claim 1 has been amended to further clarify and define the invention. Specifically, claim 1 has been amended to include the textual subject matter of claim 2, now cancelled.

Entry of the present Amendment is respectfully requested.

Rejection Under 35 U.S.C §103(a)

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Fisher *et al.*, U.S. Patent Application Publication No. 2003/0054160 (hereinafter “Fisher”) in view of Fukatani *et al.*, U.S. Patent Application No. 2004/0234778 (hereinafter “Fukatani”).

Applicant respectfully traverses the rejection.

The Examiner’s Position:

The Examiner asserts that it would have been obvious to utilize the disclosures of Fukatani in the invention of Fisher to disperse LaB₆, ITO and/or ATO in a plasticizer containing a phosphoric acid ester compound as a dispersion stabilizer to prevent haze.

Based on the following, Applicant contends that the Examiner’s position is untenable as applies to the amended claims. For the discussion below, Applicant herein provides an Exhibit, Comparison of the Claimed Invention with the Cited References, for the Examiner’s consideration.

Applicant's Position:

The present invention is directed to a color interlayer film for laminated glass which comprises a resin composition containing a polyvinyl acetal resin, a coloring agent, and an infrared ray shielding agent.

Applicant notes that the resin composition contains the following additional essential elements:

- (i) the resin composition further contains a phosphoric acid ester compound selected from the group consisting of a trialkyl phosphate, a trialkoxyalkyl phosphate, a triaryl phosphate and an alkyl aryl phosphate; and
- (ii) the phosphoric acid ester compound is at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin.

Differences between the Invention and the Cited References

Fisher

The Examiner acknowledges on page 2, item 2 of the Office Action that the Fisher reference fails to disclose the use of a phosphoric acid ester.

Thus, Fisher neither discloses nor suggests essential elements (i) and (ii) of the claimed invention. Further, Fisher is silent with respect to the specific combination of essential elements (i) and (ii) of the claimed invention.

Fukatani

Fukatani discloses in paragraph [0096] that:

“...the plasticized polyvinylacetal resin composition further contains a dispersion stabilizer. The dispersion stabilizer...may, for example, include organic...surfactant.... For example, at least one kind of compound selected from the group consisting of...phosphate ester compound...is suitably employed” (emphasis added).

Fukatani further discloses in paragraph [0097] that: “The content of the dispersion stabilizer is preferably 0.0005 to 5.0 parts by weight per 100 parts by weight of the polyvinylacetal resin.” (emphasis added).

However, Fukatani specifically discloses only a polyphosphate salt as a dispersion stabilizer in the Examples (See Fukatani, paragraph [0127], lines 3-5, paragraph [0157], lines 3-5, paragraph [0167], lines 3-5, and paragraph [0190], lines 1-4). Applicant also notes that the polyphosphate salt is different from a trialkoxyalkyl phosphate, an alkyl aryl phosphate and a trialkyl phosphate as recited in claim 1 of the present invention.

Thus, Fukatani does not specifically disclose a trialkoxyalkyl phosphate, an alkyl aryl phosphate or a trialkyl phosphate as a dispersion stabilizer.

Although Fukatani describes in paragraph [0066] tributoxyethyl phosphate, isodecylphenyl phosphate and triisopropyl phosphate, these phosphoric acid ester compounds are disclosed as an organic phosphoric acid-based plasticizer, not a dispersion stabilizer. (See Fukatani, paragraph [0066]).

Further, Fukatani discloses in paragraph [0068] that:

“The composition amount of the plasticizer is preferably 20 to 60 parts by weight per 100 parts by weight of the polyvinylacetal resin....The composition amount is more preferably 30 to 50 parts by weight.” (emphasis added).

Specifically, Fukatani discloses that the interlayer film may contain tributoxyethyl phosphate, isodecylphenyl phosphate or triisopropyl phosphate at a ratio of preferably 20 to 60 parts by weight, more preferably 30 to 50 parts by weight, to 100 parts by weight of the polyvinylacetal resin.

Thus, Fukatani does not disclose an interlayer film containing tributoxyethyl phosphate, isodecylphenyl phosphate or triisopropyl phosphate at a ratio of 5 parts by weight or less relative

to 100 parts by weight of the polyvinyl acetal resin, as required in the presently claimed invention.

Additionally, Fukatani neither discloses nor suggests the combination of essential elements (i) and (ii) of the claimed invention, *i.e.*, (i) the resin composition further contains a phosphoric acid ester compound selected from the group consisting of a trialkyl phosphate, a trialkoxyalkyl phosphate, a triaryl phosphate and an alkyl aryl phosphate (ii) at a ratio of 5 parts by weight or less to 100 parts by weight of the polyvinyl acetal resin.

The Specific Combination of Essential Elements is Unobvious Over the Cited References

Fisher is silent with respect to the specific combination of essential elements (i) and (ii) of the claimed invention, as mentioned above. Fukatani does not disclose or suggest the combination of essential elements (i) and (ii) of the claimed invention.

Therefore, those of ordinary skill in the art could not have easily arrived at the specific combination of essential elements (i) and (ii) of the claimed invention from Fisher in view of Fukatani.

Unexpected Results

A color interlayer film of the claimed invention achieves a remarkable unexpected effect of preventing against whitening even in the case of moisture adsorption by adopting the specific essential elements (i) and (ii). This remarkable unexpected effect of the claimed invention is clearly shown in the Working Examples, particularly in Table 2 (page 17) and discussed further on page 19, lines 1-6, of the present specification. Table 2 shows a haze value measured after 24 hours from the time when the color interlayer films were immersed in water at 23 °C. The color interlayer films were immersed alone or while being sandwiched between two clear glass plates.

The Table below shows the haze values of Working Examples 1-6 and the Comparative Example from the specification.

Working Example No.	Haze value (AVE)	
	Film alone	Film sandwiched between two clear glass plates
1	42.9 (-46.7)	31.3 (-57.6)
2	38.0 (-51.6)	35.0 (-53.9)
3	39.0 (-50.6)	30.8 (-58.1)
4	39.9 (-49.7)	27.3 (-61.6)
5	41.6 (-48.0)	33.6 (-55.3)
6	45.7 (-43.9)	36.2 (-52.7)
Comparative Example	89.6	88.9

Remarks: Value in parenthesis = (haze value of Working Example) - (haze value of Comparative Example)

Applicant notes that the interlayer films of Working Examples 1-6 contain 0.014 parts by weight of trioctyl phosphate (representative phosphoric acid ester compound as recited in claim 1) to 100 parts by weight of polyvinyl butyral resin.

In contrast, the interlayer film of the Comparative Example does not contain trioctyl phosphate (See page 13, line 26, to page 14, line 5, and Table 1, page 15, of the present specification).

As shown in the table above, in the case of the interlayer film alone, the haze values of Working Examples 1-6 ranged from 38.0 to 45.7, while in comparison the haze value of Comparative Example was 89.6.

In the case of the interlayer film sandwiched between two clear glass plates, the haze values of Working Examples 1-6 ranged from 27.3 to 36.2, while the haze value of Comparative Example was 88.9.

Namely, in the interlayer film alone, the haze value of Working Examples decreases by 43.9 to 51.6 (decreasing rate: 49.0% to 57.6%) as compared to that of the Comparative Example.

(The decreasing rate (%) is calculated as follows:

$$= ((hvCE - hvWE) \div (hvCE)) \times 100, \text{ where}$$

$hvCE$ = haze value Comparative Example

$hvWE$ = haze value of Working Example)

Also, in the interlayer film sandwiched between two clear glass plates, the haze value of Working Examples 1-6 decreases by 52.7 to 61.6 (decreasing rate: 59.3% to 69.3%) as compared to that of the Comparative Example.

In other words, the claimed interlayer film alone improves the effect of preventing against whitening in the case of moisture adsorption by 49.0% to 57.6%. Further, the claimed interlayer film sandwiched between two clear glass plates improves the effect of preventing against whitening in the case of moisture adsorption by 59.3 to 69.3%, as compared to the interlayer film that does not contain the specific phosphoric acid ester compound as recited in claim 1.

Applicant notes that the interlayer film that does not contain the specific phosphoric acid ester compound as recited in claim 1 corresponds to the interlayer film of the closest prior art in the Fisher reference.

Therefore based on the above, the claimed invention has a remarkable unexpected effect as compared to the closest prior art, Fisher.

With regard to the Fukatani reference, the Examiner takes the position that "it would have been obvious to utilize disclosure of Fukatani in the invention of Fisher to disperse LaB₆, ITO and/or ATO in a plasticizer containing phosphoric ester compound as dispersion stabilizer to prevent haze." (emphasis added).

However, Applicant points out that Fukatani neither discloses nor suggests that a dispersion stabilizer provides an effect of preventing haze in an interlayer film. A stabilizing effect of dispersing fine particles such as LaB₆, ITO and ATO is a different effect than the effect of the claimed invention, *i.e.*, preventing against whitening even in the case of moisture adsorption.

Further, Fukatani describes in paragraph [0016] that “An object of the present invention is to provide an interlayer film for a laminated glass and a laminated glass, which are superior in transparency, heat shield property, electromagnetic wave permeability and weatherability.” (emphasis added). The effects of Fukatani described above are quite different from the effects of the presently claimed invention. Therefore, to those of ordinary skill in the art, the effect of the claimed invention is quite unexpected in view of Fukatani.

In view of the provided data and comments, Applicant submits that one of ordinary skill in the art would not have arrived at the presently claimed invention based on the teachings within the Fisher and Fukatani references.

Regarding the secondary reference, Fukatani, this reference fails to remedy the deficiencies of Fisher. Therefore, even if the references were combined in the manner asserted by the Examiner, the result of such combination would still not suggest the claimed invention.

In light of the above arguments and amended claims, Applicant submits that the assertions made by the Examiner regarding the Fisher and Fukatani references are incorrect, thus making the Examiner’s conclusions untenable.

Accordingly, based on the above references, the present invention is not obvious to one of ordinary skill in the art.

Since claims 3, 4, 5, 7, 9 and 10 ultimately depend from claim 1, these claims are unobvious over the cited references.

Applicant respectfully requests reconsideration and withdrawal of the present rejection.

Conclusion

Applicant respectfully submits that all of the rejections raised by the Examiner have been overcome, and that the present application now stands in condition for allowance.

Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Paul D. Pyla at the telephone number below, in an effort to expedite prosecution in connection with the present application.

Respectfully submitted,

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By 
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Attachment: Exhibit: Comparison of the Claimed Invention with the Cited References

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